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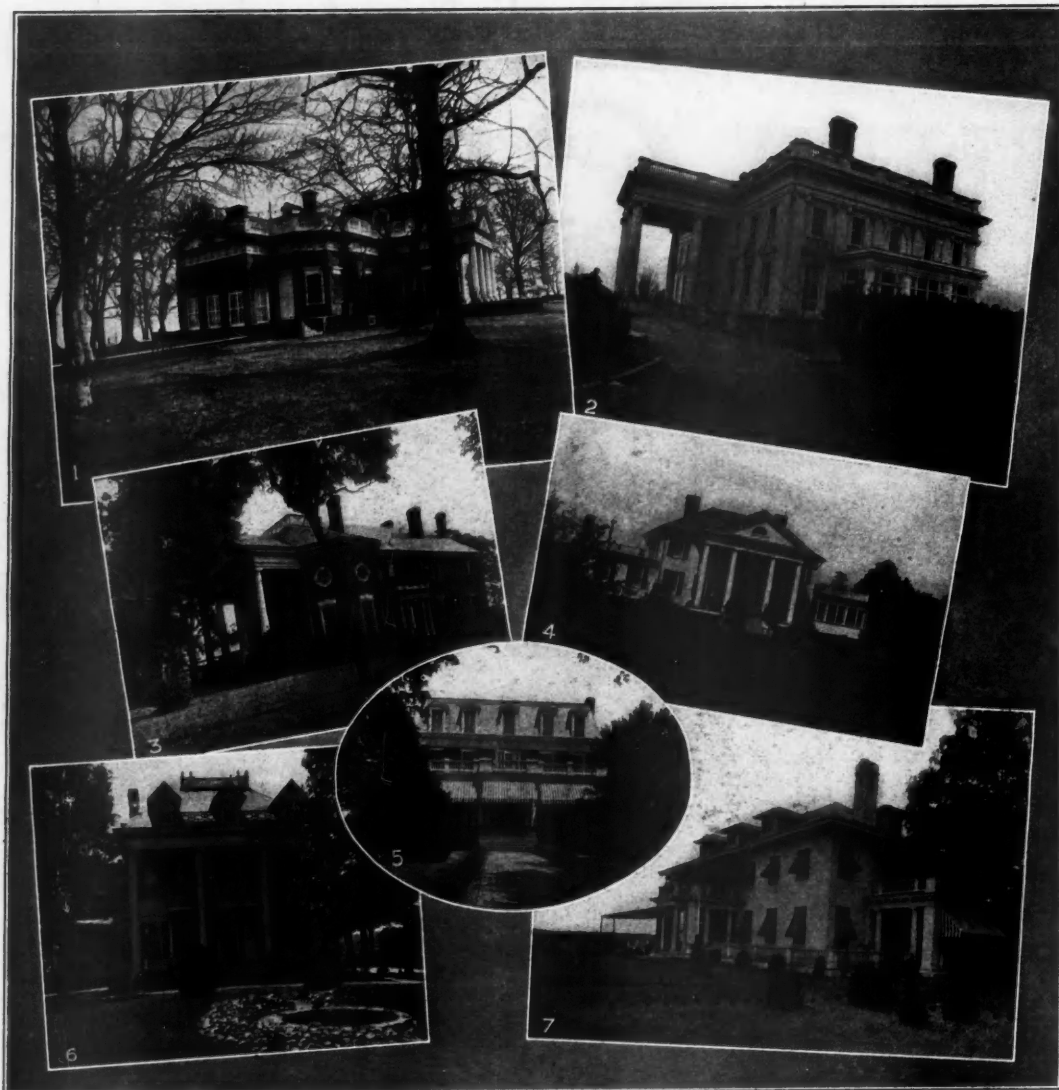


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AMERICAN FRUIT GROWER

A MONTHLY MAGAZINE DEVOTED TO FRUIT GROWING AND MARKETING

VOL. VII

JUNE, 1917

No. 6

Spray to Save the Fruit Crop

A. L. QUAINANCE, Bureau of Entomology, and JOHN W. ROBERTS, Bureau of Plant Industry, U. S. Department of Agriculture

Fruit, either in fresh, dried, canned, preserved or jellied form, is a good product of recognized value. The maximum production of good fruit at this time is, therefore, of paramount importance. Directly concerned in the production of such fruit are spraying operations for the control of various insects and diseases.

Owners of commercial orchards have long recognized the importance of spraying, but there are many small orchards and so-called home orchards, the owners of which have not adopted spraying operations, or do not give sufficient attention to the work. The increased-for condition of such orchards is too often revealed by the great number of windfall fruits and the inferiority of that which remains on the trees.

No single feature of orchard practice yields so high a percentage of benefit as spraying, often increasing the value of the product several hundred per cent. Every fruit grower, large or small, has it within his power to save his fruit from loss by insect and fungous pests, and thus add materially to the food supply of the nation. Spraying is now recognized by progressive growers as an exceedingly cheap form of insurance, not only protecting the fruit during the growing season, but insuring its proper keeping in storage.

Spraying the Apple

The apple is grown over a very large territory, and is our most important and valuable fruit crop, and when properly sprayed and handled will keep in storage for months.

The Codling Moth

The codling moth is the dirty white pinkish caterpillar which feeds within the fruit, mostly around the core, resulting in a large number of windfalls during the summer and in many fruit at harvest time. In the absence of treatments this insect will destroy each year a large proportion of the crop. Fortunately it yields readily to treatments, and a high percentage of benefit follows through spraying operations against it as outlined in the apple spraying schedule.

The Plum Curculio

This little-snout beetle attacks various fruits, as the apple, peach, plum, cherry, etc. Early in the spring the females puncture the little apples for feeding and egg-laying purposes, causing much of the fruit to fall, and the remainder which remains on the trees becomes knotty and misshapen as it

grows. The curculio is notably worse in neglected orchards, as in orchards which are in sod and more or less grown up in weeds and trash. In order to effect a satisfactory control of the curculio by sprays, these unthrifty orchard conditions must be corrected.

The Apple Maggot

This insect, often known as the "railroad worm," burrows into the pulp of the apple, making brownish patches or trails. Several maggots in the fruit will reduce the pulp to a filthy mass merely held together by the skin. Its injuries are confined largely to the Northeastern States. Present evidence indicates that the apple maggot may be controlled by the application of arsenical sprays to the fruit and foliage during early July, and some observers hold that routine orchard spraying is effective in obviating important injury. Drop wormy fruit should be promptly collected and destroyed.

Apple Aphids

Principally three species of aphids attack the fruit and foliage of the apple; namely, the rosy aphid, the green apple aphid and the oat aphid. The rosy aphid is especially injurious to the blossom clusters and causes the fruit to become knotty and distorted or to fail to thin out properly in the clusters, resulting in undersized fruit. The oat aphid is of relatively little importance, though the green apple aphid may seriously check the growth of young trees during the summer when abundant on the shoots and foliage. These aphids winter on the apple trees in the egg condition, the young hatching as the buds are breaking in the spring. They are best controlled by the use of 40 per cent nicotine sulphate used at the rate of $\frac{3}{4}$ pint to 100 gallons of spray. If the treatment for the San José scale be delayed, the nicotine may be added to the strong lime-sulphur wash, effecting combination treatment for these two pests. The nicotine may also be added to advantage to the first scab treatment of the spray schedule.

Leaf-Eating Caterpillars

Various leaf-eating caterpillars, as canker worms, tent caterpillars, and the like, are more or less abundant in orchards each year in different parts of the country. These caterpillars, as a rule, are kept well in check by the use of arsenical sprays.

Scale Insects

The San José, oyster shell and scurfy scales are very generally present

in apple orchards throughout the country. The San José scale is by all odds the most injurious and in the absence of annual treatments will destroy or greatly injure the trees. An individual scale is about the size of a pin head, and has a nipple-like prominence in the center. When abundant the scales literally incrust the limbs and branches, to which they give an ash-gray appearance. Badly infested bark when cut into usually shows a reddish color. These scale pests are very successfully controlled by the use of strong sprays applied during the dormant period of the trees, as indicated in the schedule of applications.

Apple Scab

This is the most destructive disease of the apple, and is almost universally distributed. It appears very early in the season, and causes not only grayish or brownish unsightly spots on the fruit, but often causes cracking and dwarfing of the fruit. It also appears as black blotches on the leaves. It is a cool climate disease and hence is most destructive in the more northern apple-growing regions. It is well controlled by spraying according to the methods outlined hereafter.

Bitter-Rot

Bitter-rot is typically a Southern apple disease, and in the regions in which it occurs it is one of the most dreaded. It does not appear until the weather has become hot, this date being usually about the first of July, and is one of the hardest of all diseases to control. The rotted spots, with the pink or dark-colored concentric circles of fruiting pustules, are typical of this disease. The removal of limb-cankers and mummied fruits in which it lives over from season to season is an important aid to control by spraying. In the East Yellow Newtown (Albemarle Pippin) is especially susceptible to this disease. In the Middle West nearly all varieties are susceptible to some extent at least.

Apple Blotch

This disease begins in the early part of the growing season, but is not conspicuous until nearly midsummer. It is distributed over the southern half of the apple belt and is to the South what the apple-scab is to the North. It is most destructive in Kansas, Arkansas, Missouri, Kentucky and Southern Illinois. It occurs on fruit, leaves and twigs, but is most destructive to the fruit. It appears on the fruit as an irregular brown spot with a hard roughened surface and a somewhat un-

even margin. It grows very slowly, and finally becomes somewhat sunken. In severe cases, especially on certain varieties, the fruit may finally become badly cracked. Ben Davis, Missouri Pippin and Northwestern Greening are especially susceptible to this disease.

Sooty Fungus and Flyspeck

Toward the end of the summer apples may become covered with large sooty blotches or areas of minute black spots. These diseases do not penetrate the apple skin at all, but injure the market value of the fruit by detracting very greatly from its appearance. These diseases are quite common in the moister parts of the United States and in unsprayed orchards often cause considerable financial loss. They are, in ordinary seasons, controlled by the sprayings applied for the control of other apple diseases.

Black-Rot or Ring-Rot and Leaf-Spot

These diseases are caused by the same fungus, and are controlled by cutting out the branches and twigs supplemented by the sprayings recommended for the other diseases. The applications recommended for scab-control will control the leaf-spot, and those recommended for bitter-rot will greatly lessen the losses from black-rot.

Dormant Tree Spraying

During the dormant period of trees sprays may be used much stronger than at other times, and for this reason are especially advisable for the treatment of scale insects, blister mite, etc. Applications may be made after the leaves have fallen in the fall, during warm days in the winter, or in the spring before the new growth begins to appear. Where aphids are troublesome it is often practicable to delay the San José scale treatment until just as the buds are breaking, and by adding nicotine to the strong lime-sulphur spray effect a combination treatment for these two insects.

Summer Spraying

First Application. Use lime-sulphur solution at the rate of $1\frac{1}{2}$ gallons to 50 gallons of water plus 2 pounds of arsenate of lead paste (or 1 pound of powdered arsenate of lead) just before the blossoms open. This is for apple scab, the plum curculio, canker-worms, the bud moth, case-bearers and the tent caterpillar. Add $\frac{1}{2}$ pint 40 per cent nicotine sulphate if apple red bugs are troublesome, and if apple aphids are much in evidence.

Second Application. Use same spray as in first application as soon as the blossoms have fallen. This is for the above-mentioned troubles as well as for the codling moth and leaf-spot. It is the most important application for both apple scab and the codling moth. In spraying for the codling moth at this time, the aim is to drive in the calyx end of each little apple a quantity of the poison, and, to accomplish this, painstaking work is necessary. Failure to do thorough spraying at this time for the codling moth can not be remedied by subsequent applications.

Third Application. Use the same spray indicated above 3 to 4 weeks after the blossoms fall. This is the second treatment for codling moth and leaf-spot, and gives further protection against apple scab and certain insects. In orchards in which blotch has been prevalent this application should be made not less than 3 weeks after the blossoms have fallen. Where this disease has been severe, Bordeaux mixture (3-4-50) should be substituted for the lime-sulphur solution.

Fourth Application. Use Bordeaux mixture (3-4-50 formula) and an arsenical 8 to 9 weeks after the petals fall. This is the first application for the second brood of the codling moth and for bitter-rot. In orchards in which bitter-rot has been a serious disease this application should be advanced about one week.

Fifth Application. Use Bordeaux mixture from 2 to 3 weeks after the fourth application. This is the second application for bitter-rot, and since it is very little extra expense to add an arsenical, this may be profitably done as a further protection against late-appearing larvæ of the codling moth.

Sixth Application. Use Bordeaux mixture again 2 or 3 weeks after the fifth treatment has been applied. This is the third application for bitter-rot, and is ordinarily sufficient to carry the fruit through, but on specially susceptible varieties in bitter-rot sections, a treatment to be made 2 weeks later may be found necessary.

Seventh Application. In severe cases of bitter-rot a seventh application may be necessary, and in severe cases of blotch an extra treatment midway between the third and fourth applications is sometimes necessary.

Note. In the Northern apple-growing sections the first four applications will, during ordinary seasons, be sufficient to protect the fruit from various insects and diseases mentioned. In the more Central States, where bitter-rot and blotch are prevalent, the fifth and sixth applications will be necessary. In the case of summer apples, only the first three applications are necessary.

Peach Spraying

There are four or five serious insect and fungous pests of the peach effectively controlled by spraying. Notwithstanding the fact that the larger commercial growers throughout the country have adopted measures for the control of these troubles, there is still room for such improvement on the part of many orchardists, especially those having small home or-

chards. Although successful spraying of the apple has been practiced for many years, it is only recently that sprays have been developed which are effective and safe for the tender foliage and fruit of the peach and certain other stone fruits. The development of the combination spray of arsenate of lead and the self-boiled lime-sulphur mixture has been of enormous value to peach growers, and its use has placed the cultivation of this crop on a much sounder basis than heretofore.

The Plum Curculio

This insect, already referred to under the head of apple, is the cause of a large amount of injury to the peach. Aside from the injury which it actually does to the fruit, its attack much favors the spread and infection of the fruit by brown-rot fungus. Its control is therefore especially essential in connection with remedial operations against brown-rot.

The San José Scale

This insect, also mentioned under apple insects, requires treatment on the peach. Applications should be made while the trees are dormant, and if spraying be delayed to just before the buds are due to swell, the treatment also controls peach-leaf curl. Winter strength commercial lime-sulphur solution is almost universally used in the case of the peach, since the fruit buds and twigs are more likely to be injured by oil sprays than is true of the pome fruits.

Leaf Curl

This disease affects the leaves of the peach, causing them to become reddened and curled. It begins quite early in the season and is easily controlled by the same treatment which controls scale insects.

Peach Scab

This disease is the ordinary black spot of freckles of the peach. It appears early in the summer and when several spots run together and infections are numerous, it gives the fruit a smutty appearance. Severely infected fruits are dwarfed or misshapen, and are often cracked so severely as to cause dropping. This disease causes more loss to growers than is ordinarily realized, because infected fruits so often fail to attain their normal size.

Brown-Rot

This is the ordinary rot of the peach which is so often very destructive at ripening time, and is the only peach rot of commercial importance. It is particularly destructive during warm, moist weather. Especially in the South it may sometimes cause the loss of practically the entire crop.

Schedule of Applications

In the Eastern half of the United States most of the peach orchards should be given the combined treatment of arsenate of lead and self-boiled lime-sulphur mixture for curculio, scab and brown-rot. The curculio and brown-rot are more especially troublesome in the South, whereas peach scab is worst in the Alleghany Mountain region and in the Northern States.

Midseason Varieties

The mid-season varieties of peaches, such as Reeves, Belle, Early Crawford, Elberta, should be sprayed as follows:

(1) With two pounds of arsenate of lead paste (or one pound of arsenate of lead powdered) per 50 gallons of water, to which has been added the milk of lime made from slaking three or four pounds of stone lime, about 10 days after the petals fall, or at the time the calyxes are shedding.

(2) With self-boiled lime-sulphur mixture 4 to 5 weeks before the fruit is due to ripen.

Late Varieties

The Salway, Heath, Bilyeu and other varieties with a similar ripening period, should receive the same treatment prescribed above, with an additional application of self-boiled lime-sulphur mixture alone to be applied 3 or 4 weeks after the second application.

Early Varieties

The Greensboro, Carman, Hiley, Mountain Rose, etc., and varieties of the same ripening period should receive the first and second applications only as prescribed for mid-season varieties.

Plum and Cherry Spraying

Japanese plums should receive the same treatment as peaches having the same ripening season. Soap should be added in the third application to enable the spray to stick to the smooth plum fruits.

Cherries should receive the same treatment as early varieties of peaches, except that commercial lime-sulphur solution diluted at the rate of 1 gallon to 40 gallons of water should be used in place of the self-boiled lime-sulphur. Where leaf-spot has been severe this solution should also be used in the fruit treatment. For the control of leaf-spot, an application of the diluted lime-sulphur should also be made as soon as the fruit is picked.

Plums other than the Japanese varieties should receive the treatment outlined in the peach schedule, except that commercial lime-sulphur solution diluted at the rate of 1 gallon to 40 gallons of water is to be preferred to the self-boiled lime-sulphur.

Arsenate of Lead

This arsenical comes on the market in paste and powdered form. In orchard spraying the paste is used at the rate of two pounds and the powdered lead at the rate of one pound to 50 gallons of water or fungicide, as dilute lime-sulphur solution. When used in water without a fungicide, the milk of lime made from slaking 2 or 3 pounds of stone lime should always be added for each 50 gallons of spray to obviate danger of burning fruit and foliage. This poison may be obtained of various manufacturers or usually of local seedsmen, implement dealers, or druggists. Care should always be taken in the handling and storage of arsenicals to obviate the danger of poisoning persons or live stock. Where smaller quantities of the arsenical are desired, the proportions indicated should be followed:

Lime-Sulphur Solution

Strong lime-sulphur solution is used as a dormant tree treatment for the control of scale insects and certain diseases, and in much more dilute condition as a spray on trees in foliage for the control of various fungous diseases. Many growers prefer to purchase the commercial article which comes on the market of a specific gravity of about 33 degrees Baumé. This is used at the rate of 1 gallon to 7 or 8 gallons of water for winter spraying, and at the rate of 12 gallons of water for use on apple and other pome fruits as a summer fungicide. In summer spraying the arsenate of lead and 40 per cent nicotine sulphate is added to the dilute lime-sulphur solution, thus permitting the treatment of sucking and biting insects and fungous diseases. Concentrated lime-sulphur solution can be made at home, which practice is followed by numerous growers. Those interested in this matter should write the Department for more explicit information than is feasible to give here.

Nicotine

Nicotine is used for the control of certain sucking insects as plant lice, the apple red bugs, the pear psylla, etc. This product comes on the market of various grades, but the grade known as 40 per cent nicotine-sulphate is mostly employed. This may be used alone in water to which has been added a little soap, or in lime-sulphur and arsenate of lead, or in Bordeaux mixture and arsenate of lead spray. It is employed at the rate of from 1 to 1 pint per hundred gallons of spray.

Bordeaux Mixture

Bordeaux mixture is composed of 10 pounds of bluestone (copper sulphate) and 4 pounds of stone lime to 50 gallons of water. For early summer spraying the amount of bluestone may be reduced to 3 pounds to lessen the injury. To make Bordeaux mixture for use in an ordinary hand sprayer, dissolve 3 to 4 pounds of bluestone in 25 gallons of water and in a separate container slake 4 pounds of stone lime and dilute to 25 gallons, then pour the solutions simultaneously through a strainer into the spray tank. Stock solutions, especially when large quantities are to be used, are desirable, since they save time. A stock solution of bluestone is made by dissolving it at the rate of one pound to one gallon of water. The bluestone should be suspended in a sack in the upper part of the barrel or other container so that it is just beneath the surface of the water. It will be dissolved if left for a few hours in the water and more rapidly in hot water. A stock solution of lime may be made by slaking the lime in a little water and then diluting so that each gallon of water contains one pound of lime. Just before the stock solutions are used they should be stirred thoroughly. To make up Bordeaux mixture from stock solutions, it is only necessary for 3 or 4 gallons of the stock solution of bluestone to be poured into a suitable container and 4 gallons of the stock solution of lime into a separate container, diluting each to 25 gallons and then pouring them into a single container.

(Concluded on page 8)

The Story of "Sunflekt Apples"

The Imaginary History of the Virginia Apple Industry, 1917-1925

By R. C. GANO, Illinois

(SYNOPSIS OF PRECEDING INSTALLMENTS.—The story of Sunflekt Apples, now, in 1925, occupying the same position in the apple world, began in 1917, when the Virginia growers secured the passage of a "co-operative law" similar to that of California. After the law was enacted leading growers held a meeting of representatives from 127 shipping points at Charlottesville and formed plans for State organization. Each representative went home determined to form a local organization in his section, and with complete instructions as to how to proceed. The story is now following James Doty in his effort to form a local association at Winchester, Va. He has called a meeting of all the growers within ten miles of his farm, in number, at Winchester, and is proceeding with an address in which he fully outlines a method of forming a local Apple Growers' Association. Mr. Doty is speaking.)

"Now, ladies and gentlemen, the proposed plan of incorporation, by-laws, and membership contract which I have just read contain an infinite amount of detail, naturally, which need not be borne in mind for the present. It will suffice for you to remember that I have arranged for all the necessary details and that they have worked in the case of the California growers.

It has been stated that the purpose of our proposed organization will be greater economy in packing and selling. A few figures will illustrate the economies which this same plan will secure in California, and which we can secure if we will join in carrying it out. A typical economy of local association is obtained in packing. Packing centrally, thus purchasing packing supplies wholesale, we would get them much cheaper. Evenly, we would buy supplies wholesale for locally, through a central purchasing agency. The cost of packing California oranges in boxes by this plan has been reduced, in case of oranges, from 60 cents to about 40 cents a box—in the case of lemons, from about 60 cents a box. And the pack has been improved, not cheapened.

A typical economy in State association is that secured by the traffic department of the Apple Growers' Exchange, which deals with the railroads, also influencing legislation, in the interests of the entire industry. The Traffic Department of the California Fruit Growers' Exchange, through saving reductions in freight rates and transportation charges, over a period of years, has saved the exchange, in 1904 to 1912, nearly \$100,000. The entire industry in California saved nearly \$8,000,000.

I think these few figures alone should convince us we should cooperate, though convincing figures could be shown for our departments. Now let us face the immediate practical problems of forming a local association here in Winchester.

What will we need in order that this next year, instead of packing our own fruit, we bring it in bulk to a central packing house, turn it over to the packing-house manager, and then forget about it until our apples come back for it—money that will be a better price than we could have had in the old way? Because, eventually, we will have secured rock-bottom packing and transportation rates, and selling expenses combined with preference in the market.

First, we will need a packing house. Second, we will need a competent packing-house manager, a man we can trust to grade our fruit correctly, to keep books accurately, and manage packing, storing, and shipping, neatly and efficiently.

FINANCING OPERATIONS

The need of a packing house brings up the important subject of financing initial operation. As our association will be a non-capital stock corporation, which is a new kind of organization in Virginia and unfamiliar to our people, it is probable our corporation note will not be acceptable to a local bank. Nor will we raise funds from the sale of stock—this is a non-stock corporation. Where these conditions formerly prevailed in California, the usual method for securing money necessary to erect a packing house was to borrow \$40,000, according to the size of the association—was to give the bank a corporation note and also ask the responsible directors of the association to give their personal notes as additional security. If our directors believe in this proposition they will back that risk. The money will then be advanced by the bank, a packing house built and the bank repaid from the profits of the first season.

Assuming an association will start with members and will need a packing house of \$5,000 (which can later be enlarged), there is here an initial average of \$100 to each member of \$100, though it will be a fixed cost, but will vary in the case of each member according to the amount and kind of fruit actually handled for him the first season. This can represent the initial membership fee. It will be paid, however, as outlined. That is, the \$5,000 will be borrowed from a bank, giving corporation and personal notes as security. Then the notes

will be repaid from the profits of the local from sale of members' fruit in the first season of operation.

"Operating expenses for each season are thereafter obtained in the same way, on a corporation note, and each season's sale of fruit thus finances itself, the grower being compelled to advance no money.

"If new members are later admitted they must pay as membership fee an equivalent tax per box or barrel, figured on their first season's crop following admission.

"In allowing our directors to back the initial expenditures with their personal notes, it must, of course, be understood that in case the association failed to make good, for any reason, and the directors were forced to pay their notes, they would then have an equity against all members, so that the loss would be equalized, each member standing his proportionate share.

"Bear in mind that once the expense of building a packing house is over with, it is a pure asset, and has no liabilities attached to it. It is operated forever after strictly at cost, all profits being prorated to members according to amount and grade of fruit handled for them. This amounts to conducting all of our packing and selling operations on a wholesale basis and gaining all the extra profits that come from large scale instead of small scale operations.

SELECTING A MANAGER

"The selection of a manager is probably the most important matter of all. A man who is both a business man and a fruit man and who has had experience in the kind of work involved would be the best man to get. The Charlottesville committee sent a circular letter to 150 local association managers out in California, asking them if they could recommend young men in their offices or organizations who are familiar with the management of a local association, know something of apple as well as orange growing, and have the ambition and initiative to make good if offered a local association managership in a new territory.

"The result has been nearly fifty recommendations. Letters have since been sent to a second list, and there will be enough recommendations at length so that every association which wants an experienced man as manager can secure one. "Assuming that 127 local associations are formed under this plan, they will then be divided into territorial or district groups of about ten to eleven each, making twelve groups. A "District Exchange" will be formed for each group, which will have a board of directors consisting of one director elected from each local in the group, and a salaried district manager. This manager's function will be to act as intermediary between locals in his group and the Central Exchange in distributing market information, paying money, etc. He will also attend to shipping matters, largely, ordering cars, keeping records of cars shipped, etc.

"Each of the dozen district exchanges will in turn elect one director to represent its group on the Central Exchange. The Central Exchange will thus have a board of directors of twelve men, and a salaried general manager. Mr. G. Harold Powell, general manager of the California Fruit Growers' Exchange, was formerly with the United States Department of Agriculture, and is now considered probably the foremost authority on agricultural cooperation in the world. He is high-salaried, of course, and we must have a high-salaried man, because if he does the work right he will deserve a high salary.

"The Central Exchange should probably be located in the largest city in the State, Richmond. Its business will no doubt represent the largest single business in Virginia, in time, and it should be located in the State's business center.

"It will gradually build up a national sales organization, placing sales representatives in Chicago, New York, and other big markets who will deal direct with all carload buyers of apples. The Exchange's salaried representatives will thus come in direct contact with the fruit jobbers, there being no speculators or commission men in the chain of distribution. This is unquestionably the economical way to market agricultural products.

"The Central Exchange will also organize a field department in charge of pomological experts, whose work will be to visit the local associations, standardize methods of picking, grading, and packing, etc., until we are putting out from all local associations absolutely standard packs, so that a jobber, ordering by catalog, will know, before he sees the fruit, exactly what he is buying. When that point is reached, which should not take long—we will be ready to brand our best fruit and to advertise it. The name, "Sunflekt Apples," has been suggested, and that or some other good name will be used.

"The Exchange will also gradually organize legal, traffic, supply, insurance, and advertising departments, each one of which will result in remarkable economies, just as they have in the case of the California organizations.

"To indicate, as a final word, the possibilities in this plan in a few short years, let us consider for a moment the Florida Citrus Exchange, modeled after the C. F. G. E., of California. Though it has only one-fourth of the Florida citrus fruit growers as members, already its Central Exchange conducts the biggest business in the State of Florida. It has been advertising its best fruit under the name, "Sealdsweet" for only two years, but next to Sunkist, Sealdsweet enjoys preference in many big markets already. The Tampa Times recently estimated that Exchange growers have averaged in the past few years 25 cents a box higher prices for their fruit than outsiders, and a keen business man of Florida has also estimated within the past year that due to the better business methods taught by the Exchange the growers of Florida in 1916 received \$4,000,000 more for their fruit than they would have received under the old order of things.

"That," Mr. Doty continued, "concludes the paper which I was asked to read to you. I now want to call on Mr. R. G. Simonson, formerly of the State Legislature, and whom I see sitting in the front row, here, to tell us what he thinks of this plan."

Plan Carried Out

Getting started right is the hardest thing, and much time has been spent in telling how the big Virginia Apple Growers' Exchange took its first steps. The initial plans had been well laid and painstakingly, and it appeared at once that a plan was at last on foot which possessed the divine spark of life. In not a single instance did the local association plan fail to work. All 127 associations were formed and every one is in existence to-day, eight years after the meetings at Charlottesville, Winchester and other points.

The plan was carried out in every respect as outlined. Twelve district exchanges were formed, and the Central Exchange was located at Richmond. Ralph N. Baxter, a man who had served as both local and district exchange manager in the California Fruit Growers' Exchange, has served ably as general manager of the Virginia Apple Growers' Exchange from the first. Walter Maybrook served as president of the Exchange for the first six years, and was succeeded in 1923 by Richard G. Simonson, of Winchester, who had been a director of the Central Exchange for three years. Mr. Maybrook is now a director of the Central Exchange. It is of passing interest that James Doty was a director from 1917 to 1919.

It was learned after organization was perfected that the 127 associations comprised nearly one-half of the State apple crop. Additional exchanges have been added since, and approximately 65 per cent of Virginia apples are now marketed through the Exchange. It is also significant that the State apple crop has nearly doubled in eight years and that Virginia boxed apples bearing the label "Sunflekt Apples" rank second to no apples on the market. "Skookum Apples," from the Northwest, had several years lead in the New York market and a slight lead in the Chicago market, for several years after Sunflekt advertising started; but Sunflekt advertising has been much

heavier than Skookum in the past three years, which has turned the tables, many believe, in advantage of Sunflekt.

The Exchange Field Department did remarkable work between 1917 and 1919, and advertising of "Sunflekt Box Apples" was begun in 1920, when a test campaign was tried in Ohio and Michigan. Results were so satisfactory that the appropriation was increased from \$15,000 to \$100,000 the following year, and national advertising begun. This year the appropriation is over \$200,000, which represents less than 1 cent per box of apples handled.

The Exchange is represented by either salaried sales representatives or brokers in every carload apple market in the United States and in several European centers. It is estimated there are about 3,000 carload buyers of apples in the United States. An Exchange salesman calls on every one of these buyers at least once during each year, and all are on the mailing lists of the nearest district sales office of the Exchange.

Selling Cost

The selling cost of the Exchange is around 5 per cent of gross receipts, which compares very favorably with that of the California Fruit Growers' Exchange, now about 3 per cent—considering the much greater age of the older Exchange. The Virginia growers have made savings, in every department, as was predicted, but every year finds new problems solved and a diminishing cost of operation. Combined with this is the growing popularity of the Sunflekt brand, which enables these apples to command the top market prices.

The Exchange Supply Company, a capital stock corporation formed in 1919, to further reduce packing costs and orchard supply costs by manufacturing many of the materials needed, did in 1924 a business of \$2,000,000. Stock in this company is owned by the local associations, and the 6 per cent which it pays as interest on capital stock annually thus goes into the profits of the local associations which own stock.

History repeats itself, and the Richmond News-Leader, in commenting less than a month ago on the success of the Exchange, called attention to the fact that the overturn of the Central Exchange, which exceeded \$12,000,000 last year, is the largest of any single business in the State; that the apple industry of the entire State is on a new plane of prosperity, due to the educational work of the Exchange Field Department, and that the banks of the State, which at first were dubious about lending money on the corporation notes of non-capital-stock corporations, now consider the local associations among their safest risks.

THE END

GET READY NOW TO EXHIBIT AT THE

1917 VIRGINIA STATE FAIR

RICHMOND, VIRGINIA

WEEK OF OCTOBER 8-13, 1917

THE 1917 STATE FAIR will be the greatest ever held in Virginia. Already more entries than last year. Premiums doubled in many departments. A wonderful Horticultural Exhibit assured. Plan now to enter your best and have the profit and honor of being a Prize Winner. Following are some of the premiums to be awarded:

PREMIUMS FOR APPLES

NOTE.—Remember the fruit remains your property.

SECTION 1

CLASS No. 1—Best barrel, each of the following varieties. First, \$10.00; second, \$5.00; total, \$90.00.

Albemarle Pippins—Winesaps—York Imperials—Mammoth Black Twig—Stayman—Ben Davis.

Highest scoring single box (any variety may compete)—First, \$15.00; second, \$10.00; third, \$5.00.

	1st	2d	3d
Box (1 bu.) Newton (Albemarle)	\$5.00	\$3.00	\$2.00
Box (1 bu.) York Imperial	5.00	3.00	2.00
Box (1 bu.) Winesap	5.00	3.00	2.00
Box (1 bu.) Ben Davis	5.00	3.00	2.00
Box (1 bu.) Grimes Golden	5.00	3.00	2.00
Box (1 bu.) Rome Beauty	5.00	3.00	2.00
Box (1 bu.) Jonathan	5.00	3.00	2.00
Box (1 bu.) Stayman	5.00	3.00	2.00
Box (1 bu.) Black Ben	5.00	3.00	2.00
Box (1 bu.) Delicious	5.00	3.00	2.00
Box (1 bu.) Mammoth Black Twig	5.00	3.00	2.00

Highest scoring single box (any variety may compete)—First, \$10.00; second, \$5.00; third, \$3.00.

SECTION 2—PLATE

	1st	2d	3d
Albemarle (Newton) Pippin	\$3.00	\$2.00	Rib.
Mammoth Black Twig	3.00	2.00	Rib.
Ben Davis	3.00	2.00	Rib.
Delicious	3.00	2.00	Rib.
Grimes Golden	3.00	2.00	Rib.
Jonathan	3.00	2.00	Rib.
Stayman Winesap	3.00	2.00	Rib.
Winesap	3.00	2.00	Rib.
York Imperial	3.00	2.00	Rib.

SECTION 3—PLATE

	1st	2d	3d		1st	2d	3d
Arkansas Black	\$2.00	\$1.00	Rib.	Paradise Winter	\$2.00	\$1.00	Rib.
Baldwin (Red)	2.00	1.00	Rib.	Sweet	2.00	1.00	Rib.
Duchess	2.00	1.00	Rib.	Mammoth Black	2.00	1.00	Rib.
Early Ripe	2.00	1.00	Rib.	Twigg	2.00	1.00	Rib.
Fall Cheese	2.00	1.00	Rib.	Rambo	2.00	1.00	Rib.
Fall Pippin	2.00	1.00	Rib.	Red Astrachan	2.00	1.00	Rib.
Lady	2.00	1.00	Rib.	Rome Beauty	2.00	1.00	Rib.
Maiden Blush	2.00	1.00	Rib.	Shockley	2.00	1.00	Rib.
Milam	2.00	1.00	Rib.	Smith Cider	2.00	1.00	Rib.
Lowry	2.00	1.00	Rib.	Smokehouse	2.00	1.00	Rib.
Mother	2.00	1.00	Rib.	Tompkins' King	2.00	1.00	Rib.
Northern Spy	2.00	1.00	Rib.	Virginia Beauty	2.00	1.00	Rib.
Pilot	2.00	1.00	Rib.	Yellow Bellflower	2.00	1.00	Rib.
				Bonum	2.00	1.00	Rib.

SECTION 4—ARTISTIC SINGLE ORCHARD DISPLAY

Each exhibitor to be allotted so many feet of space to be filled with his fruit and decorations, said fruit to be of any variety of apples (only) as he may choose, packed and arranged as he may choose, provided that said decorations shall not obscure the adjoining exhibits.

The quality of the fruit shall be first of importance, but much consideration shall be given to artistic arrangements, decorations and attractiveness. To be scored on the following points:

	Points
Quality of fruit	100
Freedom from blemishes	200
Color	100
Size of fruit	100
Display of commercial packages and pack	100
Commercial value of varieties	100
Artistic and color harmony of exhibit	100
Effective presentation of apples	100
Decorative material, including flowers	100

First prize	\$ 75.00
Second prize	50.00
Third prize	25.00
Barrel Class—6 named varieties	90.00
Barrel Class—best (any variety)	30.00
Box Class—11 named varieties	110.00
Box Class—best (any variety)	18.00
Plate Class—9 named varieties	45.00
Plate Class—27 named varieties	81.00
Orchard Display Class	150.00

2d Premiums on Pears and Grapes will be announced later.

FREE—"Virginia State Fair News"—Write for Copy

Send your name and address for free copy of Virginia State Fair News, which gives interesting particulars about the 1917 Fair, premiums to be awarded, etc. Also for Complete Premium Catalog, now on the press.

VIRGINIA STATE FAIR ASSOCIATION

ROOM 7, MUTUAL BLDG.

RICHMOND, VIRGINIA

DUST METHOD AND LIQUID SPRAYS

W. J. SCHOENE, State Entomologist.

Applying insecticides in the form of a dust is not by any means new. During the past twenty-odd years there have been numerous experiments in which the efficiency of insecticides and fungicides applied in the form of a dust were compared with the same materials applied in the form of a spray. Many entomologists, horticulturists and fruit growers have recognized the disadvantage of applying the poisons and insecticides as a spray, which necessitates the hauling of considerable quantities of water through the orchard. The advantages which would be derived from the application of poisons in the dry form have always been a stimulus to these experiments. Until within the past two or three seasons, all comparative tests of the two methods have shown that the liquid sprays gave greater protection and that a greater percentage of the fruit was free from injury.

Within the past two or three years, however, the machines employed for dusting work have been very materially improved, likewise the materials used for dusting have also been developed so that without question the differences in effectiveness which exist between the two methods are not so great as formerly.

Late Experiments

In New York, at the Cornell Station, an extensive series of experiments have been carried on for two seasons in which these methods were compared in a practical way; also during the same period similar experiments were being conducted at the Illinois Experiment Station. The results of these tests can not be gone into in detail, but it is sufficient to note that the dust method has given excellent results in preventing injury by codling moth and a fair degree of control of apple scab. The advantages that the dust method has over the older liquid spray are such that fruit growers should investigate this method. The dust machine itself is very light and thoroughly adapted to rough land. It is simple in operation and much less expensive than the ordinary power spraying outfit. The chief advantage, however, to be considered is the speed with which the dust can be applied to the trees. The application can be made very quickly, even from 30 to 40 acres in a single day being not unusual. Persons who have been accustomed to using liquid spray feel that the application of the dust is a very awkward operation and many are prejudiced against it.

As to the cost, there seems to be very little difference in spraying or dusting for the codling moth. In applying the poison in the form of dust must greater quantities of material are used, but the increased cost of the poison is offset to a considerable extent by a saving of time and labor. Fruit growers who have had difficulty in controlling the codling moth and who have such a large acreage to spray that they are not able to get over the entire orchard within a few days after the petals fall, should investigate the dust method.

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LEASING APPLE ORCHARDS

O. D. OWENS, Ohio

We have had some experience in leasing apple orchards. Several years ago we leased some orchards at the time we purchased a twelve-acre orchard and set three acres to young trees. Our two boys were at home each summer during college vacations, and, as we were doing no general farming at that time, we considered that the leased orchards would serve to keep us all busy during the summer season, and be a source of profit as well. One orchard was leased for three years, the annual rental being the rate of fifty cents per tree. The trees were in a thrifty condition, but had never been well pruned. Two of the three were profitable for us, but one year of poor production caused a loss of most of the

At the end of the three years we made a new bargain by which we took the orchard at the same rental per acre, we to fertilize the trees and spray necessary and at the beginning of any year, if we saw fit, we could be released from paying the rent and could turn back to the owner the orchard for that particular season. This guaranteed us from any great loss, and at the same time it was a satisfactory deal for the owner of the orchard, as the trees had greatly improved under the care we gave them, and this condition could not be so certain if the orchard had been given to the usual renter.

Equal Division of Fruit

Another lot of trees was leased with agreement that we should make an equal division of the fruit, the owner making the fertilizer and we to market the fruit ready for barreling, then to divide the expense. In the course of the three years the profit from this orchard amounted to fairly good wages for myself and two sons. The trees were about twenty-two years old, and had been well fertilized several years.

In leasing an orchard one must consider the length of the haul to market, the condition of the trees, the soil, and the variety of fruit as well as the age of the trees. When trees are very tall, the extra time consumed in pruning, spraying and marketing the fruit adds considerable expense to the average cost per barrel of the fruit marketed, and on this basis most of the farm orchards should be leased on the two-thirds basis if the renter expects to make a satisfactory profit. On the other hand, should I have occasion to use any part of my orchards to another purpose, I should insist that he keep up the fertility of the soil as well as to the necessary pruning and marketing.

ARTICLE ON INTER-CROPS

Article No. 19, of the Pennsylvania State College of Agriculture, College, Pa., discusses what crops to grow in orchards. Every farmer is brought face to face with this problem, and it is desirable that he should be able to solve it satisfactorily and profitably.

HOW APPLE LAW WORKS

The address of Commissioner of Agriculture Wilson, made before the New York Fruit Growers' Association, is worthy of the attention, not only of those who pack under the New York State law, but also of all who live in states where the apple-packing and grading law is either in operation or under consideration.

The commissioner points out that while, during a favorable year, the grower felt the law to be to his advantage, yet so soon as the crop was of poorer quality many expressions of discontent were heard. He believes that the greater part of this discontent arises through lack of understanding of the operation of the law, and also that many forget the great benefits of the law in a season of poor fruit.

First he dealt with the objection that there are fruits that develop defects in storage—such as scab and scald, for which the packer should not be held responsible. His assurance is given that this is recognized by the state inspectors and due allowance made therefor. It is generally possible to decide what defects have developed in storage; when there is a doubt the packer is given the benefit, and no action is taken.

Again, the packer claims that his name may still appear upon the barrel after it has passed into the hands of the dealer, who may tamper with the pack in various ways and even mark up the grade. In such case the packer feels justly aggrieved, but the facts hardly bear him out. When defect is reported by the inspector, the case is brought against the dealer, and only when it has been satisfactorily proved that the dealer is not, in this particular case responsible, is it carried back to the producer to determine whether the fruit was below standard when packed. Each person possessing the fruit shares the responsibility. The packer gets that for which he is answerable, the producer comes in only for his share.

It seems that such being the practice it would be difficult to improve the working of the law even if the wording of it may be changed.

Another dissatisfaction directly related to a season of poor crops, is that which demands a larger tolerance in each grade. This is almost surely not desirable in the Fancy and A grades, and to the commissioner's mind is a doubtful good even in the B grade.

He also points out that the feeling on the part of the producer and packer against the word "ungraded," as applied to fruit that has only fungous defects, is unfounded, as reports of sales go to show that this brand is accepted by dealers without prejudice and the fruit is sold for what it is worth.

Before long, we predict that all apple-growing states will have a packing and grading law, and it is of great importance for each community to inform itself as far as possible on the form and working of the law in other states.

A good farmer doesn't need to know everything about agriculture. But he ought to know where to look for it when he needs it.

TOBACCO SPRAY EXPERIMENTS

F. A. DeSelle, fruit inspector for Yakima County, Wash., has for the last two years been making some experiments with nicotine sulphate at a spray for scale and codling moth. These experiments have not been carried far enough to warrant final conclusions, but they at present seem to justify the prediction that in the near future tobacco spray will take the place largely of lime-sulphur and arsenate of lead. Its value seems to be that it not only kills the scale and codling moth, but aphids and other insects as well. It is also claimed that it checks, but does not entirely prevent, the spread of blight.

Mr. DeSelle summarizes his conclusions in a bulletin he has published as follows:

"1. While we are not ready to make a final statement, the work during 1915 and 1916 indicates that nicotine sulphate acts as a material check to the work of the codling moth.

2. At the present prices for nicotine it would not be advisable to substitute nicotine sulphate for arsenate of lead in codling moth control alone, but where aphids and sucking insects are to be controlled the omission of lead will result in a considerable saving.

3. In the above demonstrations when nicotine sulphate and arsenate of lead have been used side by side the former has proved as efficient as the lead in codling moth control and has kept the trees free from all sucking insects.

4. Trees sprayed with nicotine sulphate showed much higher percentages of extra fancy and fancy fruit than the trees sprayed with lead. The fruit was more highly colored.

5. Observations during the seasons of 1915 and 1916 indicate that the nicotine acts as a material check to the spread of San José scale.

6. In the nicotine sprays the addition of soap is advisable.

7. It does not seem necessary to use nicotine stronger than 1 to 800 for codling moth, and 1 to 1024 has given nearly as good results.

8. It is expected to continue the work under the most severe conditions this coming season."

Experiments similar to the above will be conducted during 1917 by Prof. W. J. Schoene, of the Virginia Experiment Station, at Greenwood, Va., in the orchard of the editor of the *AMERICAN FRUIT GROWER*.

NEW SUB-STATION

West Virginia has a new sub-station for its experimental department. The L. A. Reymann estate recently donated farms consisting of 931 acres, near Wardensville, W. Va. They are well equipped and have 110 head of pure-bred Ayrshire cattle, a cheese factory, etc. Over 200 acres are tile drained.

Mr. Luther F. Sutton, who is well known to our readers for his valuable and interesting articles as editor of the Small Fruits Department, has been made superintendent and horticulturist.

NUT GROWING EXPERIENCE

GEORGE P. DODGE, Virginia

Nothing appears in your publication in regard to the possibilities of nut culture here in the East, and I would say a few words about the Persian Walnut. Considerable experimenting has been done with it and some definite information is available now; such as, that only grafted stock should be used, that commercial success depends on the proper choice of soil and varieties, and that they may have to be sprayed.

I have a hundred Persian Walnuts that have been planted two years, and my observation of them coincides with what now is advised as to varieties. The Rush, Hall, Pomeroy, Franquette, and Mayette have been considered the most promising for the East. Of these, the Franquette and Mayette, French stock, are becoming to be the most recommended because of their tendency to remain dormant long after other varieties bud out.

With my young trees the Franquette and Mayette have been the last to leaf out by several weeks. Obviously, this is a big protection against frost and blight damage. Blight, twig blight in the spring, frost, and codling moth have been the heaviest sources of loss with the walnut growers of California and Oregon. But a power sprayer will attend to the moth, and late-budding varieties should escape frost and much of the blight.

The soil requirements may vary according to the variety, but in general a rich, deep loam is necessary. The walnut requires room—down, up, and around. An expert sent from Oregon to study walnut growing in France and Spain reported that there the so-called groves were lines of trees following water courses and groups of trees in rich pockets of land. His report advised against a solid grove or block planting—as with apples, etc.—the inner trees not thriving.

Commercially, the opportunity in planting walnuts lies in the utilizing of waste places not suitable for other fruit, as along creeks and branches and scattered pockets of rich soil. They need cultivation only for the first year or two. Stock will not bother them, though set in pastures they should be protected while young.

A limiting factor is the high cost of the trees and often a heavy loss in getting a stand. But once started they will outgrow an apple two to one and commence to bear the third year. The tree requires little or no pruning. The crop picks itself. It is not a perishable crop. And the local markets should be good. The present supply comes wholly from the Pacific Coast and abroad.

CIDER BECOMES POPULAR

It is reported that cider has become a much more popular drink since the State of Washington went dry. It is estimated that there were 6,000 tons of apples converted into by-products during the past season, and that a very large percentage of this product was cider.



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Photographs of scenes are gladly received, and will be reproduced if of general interest, and clear enough to make satisfactory plates.

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Entered as second-class matter, March 15, 1917, at the post-office at Lynchburg, Va., under Act of March 3, 1879.

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We will not mail receipts for subscriptions in the future. Instead, the date to which your subscription is paid will appear each month on the wrapper in which you receive the AMERICAN FRUIT GROWER. When renewals are received the date will be changed to correspond with the payment, usually the second month after the receipt of the payment, as the wrappers are prepared some time ahead of the mailing date. 2-18 means that your subscription is paid to February, 1918; 11-17, to November, 1917, and that they are last issues you will receive, unless you send in your renewal.

Less Drink—More Food

While there seems no occasion to grow panicky over the food situation in the United States, yet it would be folly to close our eyes to the fact that we are short of foodstuffs and that the demand for them is going to be unusually heavy.

We must feed ourselves first, after which we must supply the crying needs of our allies who will continue to need aid long after peace is declared. When the war is over we must even, if it be possible, feed the starving central powers who will then no longer be foes.

This creates an uneasy situation, if nothing more. We should be thinking, and thinking hard, of all possible ways to answer the high price of living and the shortage of food. Besides paying more attention to agriculture than even before, we must save. It is apparent that no single economy would make such a tremendous saving as would be effected by giving up the practice of turning good bread grain into alcoholic drinks.

Alcohol harms the man. Bread is the staff of life. Millions of bushels of grain go yearly into the production of "booze." Drink makes the soldier, the sailor, the mechanic, the farmer, less efficient. Why not turn these many bushels of grain into bread to make hearty and healthy workers, men, women and children? We need their services as much as they need the food.

Here indeed would be a case of sweet coming out of bitterness if the war should open our eyes to the waste and harmfulness of converting our food grains into intoxicants. In order not to waste such a deluge of liquor as is already stored it has been suggested that alcohol is a requisite in the manufacture of ammunition. It will take a lot of it to fill the present demand, and so John Barleycorn may yet be put to work for his country.

Absentee Fruit Growers

The excitement of a few years ago over fruit growing carried many city people into the business and created a large class of absentee fruit growers. Being business men, they have aimed to conduct their places on a business basis and for profit. In so far as they have succeeded, they have helped the industry; in so far as they have failed, they have hindered the industry.

Those owners who bought places outright and set up their own establishments have generally followed the practice of putting working foremen on them, retaining for themselves the general direction of all farm operations. Time has shown that capable and trustworthy working foremen are hard to get, and hard to keep; time has also shown that many men in these positions are incapable or untrustworthy, sometimes both. The dishonest ones have practiced petty deceptions, cunningly conceived and cleverly executed. Resident owners often detect such dishonest practices—selling some of the seed and fertilizer sent to the place, hiring out the teams and pocketing the money, loaf-

ing at the village store under the pretext of waiting for some repair work—long before the absentee owner ever suspected that things were not going quite right.

One day the absentee owner knows the whole truth. In some instances, resident owners and growers have been accused of aiding and abetting the dishonest working foremen. The charge is based on the assumption that honest neighbors would have informed the absentee owner of dishonest practices on his place, forgetting that honorable men everywhere detest tale bearing. Besides, the resident owner has probably held aloof from the people of the community, not consulting them in any matter. Not being consulted in a neighborly way about fruit growing in general, they naturally conclude that council is not wanted. The absentee owner is to blame.

The way out for those who are still struggling with the problem of the local management of their places leads to the home of one of the local owners and growers. By retaining some resident owner in an advisory capacity there will be local authority for information which can not be otherwise obtained. The best man will not charge very much for his services and will save many times more than he receives. Tell him what is on the place, how many trees, how much material is ordered, how many sprays, what crops and the acreage. Your local foreman will not tell you that the seed did not germinate, that one of the horses was sick and the plowing could not be done, and so on. He will know that somebody knows who knows.

Save Money by Thinning

We have never been able quite to understand the position of the orchardist who believes that it is a waste of time and money to thin his fruit. It will soon be the thinning season, and the harvest time will show conclusively how mistaken many a grower has been in leaving on his trees all the apples they will bear.

Lately we visited a large, well-kept orchard, where half the crop was undersized and, incidentally, under-colored. It took a lot of those apples to fill a No. 3 barrel. It took the pickers just as long to pick each little apple as to gather the big, blushing beauties. It brought the grower much less per barrel than No. 1 fruit.

The orchardist referred to is a good, careful fruit grower in most respects. He prunes, sprays, fertilizes at the right time—but when it comes to thinning his crowded apples he claims it takes too much time and money. It would seem obvious that if all the apples must be picked eventually, as every one agrees is essential, it would cost rather less, than more, to have them removed while they are small and can be thrown on the ground than when every apple must be carefully placed in the baskets.

By thinning you get fruit of far higher quality, you save your trees from exhaustion, and the actual outlay for thinning is less than if you wait until autumn and have the good, bad and indifferent harvested together.

Don't Keep Drones

We were interested in talking to a man whose theme was that it was unprofitable business taking care of drones in the orchard. The tree that bears little or no fruit receives the same attention and demands the same expense as its fruitful neighbors, gives no reward for the care lavished upon it.

"What remedy," we asked, "can you suggest for this condition?" "First," he said, "you must cut your drone." His method was to observe his trees individually at harvest time, and, in a notebook where he kept a page for each orchard row, to write down the aspect of behavior of the tree that answered a certain number in that row.

In this way he recorded the yield of each tree for a succession of seasons, and, when proof was positive that a tree was not earning its living, he moved it and supplied its place with young, healthy stock. The mere fact that a tree was not doing well did not condemn it. Its symptoms were noted and the best-known remedy given. Generally the tree responded nobly to this attention. If it was suffering from incurable trouble, such as crown gall or hairy root, time was wasted before cutting down.

This method of close inspection of each tree was found to be rewarding from many points of view. Poor drainage was detected, bad condition of the soil, frequency and cause of certain defects in the fruit of individual trees. The notebook became a valued business partner. We were like to see the readers of the AMERICAN FRUIT GROWER enter into such a partnership.

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Fruit growers may profit by the example of the National Dairy Council which has lately concluded a campaign for increased consumption of dairy products. Very likely you have noticed the series of advertisements which lately appeared in publications of nation-wide circulation, drawing attention to the food values of each kind of dairy produce.

People were induced to realize the value of an increased use of milk, ice-cream, butter and cheese, and could be equally well nourished at much less expense than formerly. Response to this campaign was so great that the Dairy Council now proposes to go a step further and start a milk-selling campaign among dealers and distributors in the country.

The National Dairy Council numbers 280,000 dairymen and men of allied interests, and they are fully anticipating the cooperation of city dealers, who, though they for some time past have advertised dairy products, have always done so from the personal point of view, as the superiority of the article which they personally deal. Now the big idea of advertising dairy products as a desirable class of food is presented to them. If the dealers are enough in their outlook they will heartily enter into this scheme of larger scope.

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OSCAR H. BENSON, *U. S. Department of Agriculture*, and GEORGE HERBERT BETTS, *Cornell University*

For the farmer who wishes to gather together in a concise, simple and practical form a tremendous mass of useful information, this book stands alone as holding between the covers of its 765 pages the essence of the great volume of material that is being turned out by the press for the benefit of the man who works the soil. Some chapters deal with business methods, some with the discoveries of experts; in fact, every problem that arises on the modern farm is here dealt with clearly, cleverly and in a manner to be comprehended by the ordinary reader. It is well illustrated and well bound.

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Advice on the planting and culture of your garden is given in an attractive and easily understood form. Forty-eight line engravings illustrate the text. It is the kind of book that most of us need, and one that nursery-men might do well to recommend and offer for sale to their customers. The subject is treated from a fresh and original point of view, and will be found anything but tedious to the amateur.

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The editor is an attorney for the farmer in the court of public opinion.

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To the orchardist, however, handsome is as handsome does, and the rabbit acts most unhandsonely toward young fruit trees. Unless the weather is very severe, bunny confines his attentions to young prunings and the tender bark of small trees. Often during snowy weather, when his usual supply of food is covered up, he will girdle the young trees, and sure death ensues for the tree.

It is more desirable that the rabbit should die first. In many states the game laws protect rabbits for a considerable season, but orchardists are in some states permitted to take steps to suppress them. The best and simplest of these methods would seem to be the use of the following poisoned tree wash, which has proved most satisfactory in the West.

Dissolve one ounce of strychnine sulphate in three quarts of boiling water and add one-half pint of laundry starch, previously dissolved in one pint of cold water. Boil this mixture until it becomes a clear paste. Add one ounce of glycerine and stir thoroughly. When cool apply to the trunks of the tree with a paint brush. The action of the poison is so rapid that it kills the rabbit before he can gnaw to a hurtful extent.

This method has the advantage of not being dangerous to live stock, as poisoned oats, or poisoned green bait are. Woven wire netting of 1½-inch mesh is effective, if placed properly round the tree.

HURRAH! FOR CHAMPAGNE CIDER

Like poor, thriftless Bill Jones' herd of cows, the states are all either dry or going dry. Now comes the news that the thirsty ones, who live sadly within the limits of the law, are to be refreshed by a cider that is first cousin to champagne in flavor.

At the Apple Show in West Baden, Ind., one big brewery demonstrated its foresight and ability to meet the coming alcoholic drought by introducing a cider developed by an entirely new process.

It is of a bright, clear appearance, and contains all the health-giving qualities of the apple; added to this, it has a true champagne flavor that recommends it to men, as well as women. We congratulate the Thyme-Wagner Brewing Co., of Indiana, on this achievement. It will help us to "be good," and it also opens up a great future for the disposition of culls—that bogey of the conscientious apple grower who has always refused to dump unworthy fruit on the market.

The man whose wishbone is where his backbone ought to be has not learned how to negotiate trouble. Pile up your failures against the high wall of success and use them as a ladder.

PREVENT WOOD DECAY

Especially in the stone fruits, wood decay causes great loss. A decayed tree may grow and bear fruit, but it soon shatters in a severe storm, or breaks under its load. Then there is the expense of planting another tree and waiting for it to come into bearing.

We recently read an account of fifty-year old peach trees still vigorous and bearing fruit. The claim was made that this was because the tree had been protected from wood decay. If we could gather crops for fifty years from the same peach trees it would seem worth while to keep them in good condition.

The decay is caused by fungi that enter some wound or unprotected spot—such as a portion over which the bark is dead and affords no shield from the fungi. Infection takes place only from spores that fall on dead bark or into the cracks of wounds. The resulting fungi grow in the wood, and, by a process of digestion, use it up and leave only ash.

The prevention consists of disinfecting any wound with a germicide, and, as soon as that is dry, painting over with some sealing paint. This should be done immediately, so that no cracks may form nor spores enter. No sealing paint can be counted on to last more than a year, and, therefore, the place should be repainted every season until the wound has completely healed over.

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California, with her enormous prune industry, has for the past three years conducted experiments that seek to solve some pollination problems. The resulting bulletin, No. 274, from the College of Agriculture, Berkeley, Cal., is worthy the perusal of every horticulturist.

Most interesting are the results of a special experiment upon two pairs of adjoining French and Imperial prune trees which were inclosed in large tents of mosquito bar before the blossoms opened. Into one of these tents a hive of honey bees was introduced and there kept throughout the blossoming period. Into the other tent no insect of any sort was admitted during the blossoming period.

The table of percentages of fruit that actually matured shows that, while the French prune responded almost excessively to the pollenization of the bees, the Imperial prune for some unknown reason fell below the average orchard set, though quite beyond the tree from which all insects had been excluded.

Further experiments are promised along this line in an endeavor to solve the puzzle of the poor set of fruit on this Imperial prune tree.

The bulletin is very suggestive for fruit farmers of all sections, and especially interesting is the project of the prune growers to hire hives of bees from men having large swarms and to place them in the orchards during the blossoming period. This plan is already in use in the orange groves of Southern California.



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ADVERTISEMENTS of meritorious articles needed by the fruit grower and farmer solicited. Frauds and irresponsible firms are not knowingly advertised, and we will take it as a favor if any readers advise us promptly should they have reason to question the reliability of any firm which patronizes our advertising columns. Discriminating advertisers recognize the AMERICAN FRUIT GROWER as the best medium in the Middle Atlantic States through which to reach the most intelligent and up-to-date fruit growers and farmers. Rates: \$2.10 per inch. No disguised advertisements are accepted at any price.

Communications are solicited from practical fruit growers. Names and addresses must accompany all communications, although they will not be published if so requested. All articles and photographs used are paid for at our regular rates.

Photographs of scenes are gladly received, and will be reproduced if of general interest, and clear enough to make satisfactory plates.

QUESTIONS—Subscribers are at liberty to ask questions on any phase of fruit growing, and will be answered through the paper or by mail as promptly and carefully as possible. We do not answer questions from those who are not subscribers. When writing for information always give name and post-office address, and enclose a two-cent stamp if answer is desired by mail.

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We will not mail receipts for subscriptions in the future. Instead, the date to which your subscription is paid will appear each month on the wrapper in which you receive the AMERICAN FRUIT GROWER. When renewals are received the date will be changed to correspond with the payment, usually the second month after the receipt of the payment, as the wrappers are prepared some time ahead of the mailing date. 2-18 means that your subscription is paid to February, 1918; 11-17, to November, 1917, and that they are last issues you will receive, unless you send in your renewal.

Less Drink—More Food

While there seems no occasion to grow panicky over the food situation in the United States, yet it would be folly to close our eyes to the fact that we are short of foodstuffs and that the demand for them is going to be unusually heavy.

We must feed ourselves first, after which we must supply the crying needs of our allies who will continue to need aid long after peace is declared. When the war is over we must even, if it be possible, feed the starving central powers who will then no longer be foes.

This creates an uneasy situation, if nothing more. We should be thinking, and thinking hard, of all possible ways to answer the high price of living and the shortage of food. Besides paying more attention to agriculture than even before, we must save. It is apparent that no single economy would make such a tremendous saving as would be effected by giving up the practice of turning good bread grain into alcoholic drinks.

Alcohol harms the man. Bread is the staff of life. Millions of bushels of grain go yearly into the production of "booze." Drink makes the soldier, the sailor, the mechanic, the farmer, less efficient. Why not turn these many bushels of grain into bread to make hearty and healthy workers, men, women and children? We need their services as much as they need the food.

Here indeed would be a case of sweet coming out of bitterness if the war should open our eyes to the waste and harmfulness of converting our food grains into intoxicants. In order not to waste such a deluge of liquor as is already stored it has been suggested that alcohol is a requisite in the manufacture of ammunition. It will take a lot of it to fill the present demand, and so John Barleycorn may yet be put to work for his country.

Absentee Fruit Growers

The excitement of a few years ago over fruit growing carried many city people into the business and created a large class of absentee fruit growers. Being business men, they have aimed to conduct their places on a business basis and for profit. In so far as they have succeeded, they have helped the industry; in so far as they have failed, they have hindered the industry.

Those owners who bought places outright and set up their own establishments have generally followed the practice of putting working foremen on them, retaining for themselves the general direction of all farm operations. Time has shown that capable and trustworthy working foremen are hard to get, and hard to keep; time has also shown that many men in these positions are incapable or untrustworthy, sometimes both. The dishonest ones have practiced petty deceptions, cunningly conceived and cleverly executed. Resident owners often detect such dishonest practices—selling some of the seed and fertilizer sent to the place, hiring out the teams and pocketing the money, loaf-

ing at the village store under the pretext of waiting for some repair work—long before the absentee owner ever suspected that things were not going quite right.

One day the absentee owner knows the whole truth. In some instances, resident owners and growers have been accused of aiding and abetting the dishonest working foremen. The charge is based on the assumption that honest neighbors would have informed the absentee owner of dishonest practices on his place, forgetting that honorable men everywhere detest tale bearing. Besides, the resident owner has probably held aloof from the people of the community, not consulting them in any matter. Not being consulted in a neighborly way about fruit growing in general, they naturally conclude that council is not wanted. The absentee owner is to blame.

The way out for those who are still struggling with the problem of the local management of their places leads to the home of one of the local owners and growers. By retaining some resident owner in an advisory capacity there will be local authority for information which can not be otherwise obtained. The best man will not charge very much for his services and will save many times more than he receives. Tell him what is on the place, how many trees, how much material is ordered, how many sprays, what crops and the acreage. Your local foreman will not tell you that the seed did not germinate, that one of the horses was sick and the plowing could not be done, and so on. He will know that somebody knows who knows.

Save Money by Thinning

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Lately we visited a large, well-kept orchard, where half the crop was undersized and, incidentally, under-colored. It took a lot of those apples to fill a No. 3 barrel. It took the pickers just as long to pick each little apple as to gather the big, blushing beauties. It brought the grower much less per barrel than No. 1 fruit.

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"What remedy," we asked, "could you suggest for this condition?" "First," he said, "you must call your drone." His method was to observe his trees individually at harvest time, and, in a notebook where he kept a page for each orchard row, to write down the aspect and behavior of the tree that answered a certain number in that row.

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California, with her enormous prune industry, has for the past three years conducted experiments that seek to solve some pollination problems. The resulting bulletin, No. 274, from the College of Agriculture, Berkeley, Cal., is worthy the perusal of every horticulturist.

Most interesting are the results of a special experiment upon two pairs of adjoining French and Imperial prune trees which were inclosed in large tents of mosquito bar before the blossoms opened. Into one of these tents a hive of honey bees was introduced and there kept throughout the blossoming period. Into the other tent no insect of any sort was admitted during the blossoming period.

The table of percentages of fruit that actually matured shows that, while the French prune responded almost excessively to the pollenization of the bees, the Imperial prune for some unknown reason fell below the average orchard set, though quite beyond the tree from which all insects had been excluded.

Further experiments are promised along this line in an endeavor to solve the puzzle of the poor set of fruit on this Imperial prune tree.

The bulletin is very suggestive for fruit farmers of all sections, and especially interesting is the project of the prune growers to hire hives of bees from men having large swarms and to place them in the orchards during the blossoming period. This plan is already in use in the orange groves of Southern California.

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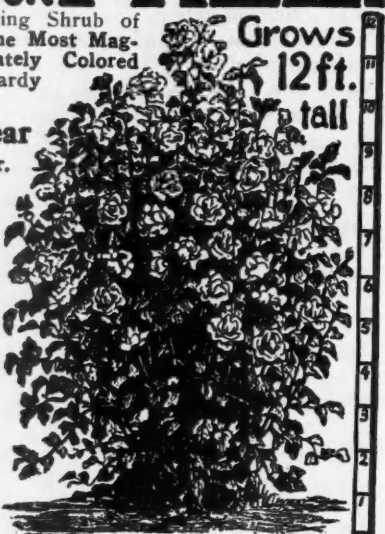
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Kindly Mention American Fruit Grower when writing to Advertisers

SPRAY TO SAVE THE FRUIT CROP

(Concluded from page 2)

taneously into the spray tank. Commercial Bordeaux may be used in place of the home-made product.

Self-Boiled Lime-Sulphur

The self-boiled lime-sulphur mixture consists of 8 pounds of sulphur and 8 pounds of good stone lime to each 50 gallons of water, and is made as follows: The lime is placed in a barrel and enough water added to nearly cover it. As soon as the lime begins to slake the sulphur should be added. Water should be added from time to time to form a thoroughly thick paste, which should be constantly stirred. As soon as the lime is entirely slaked, enough water should be added to cool the mixture, which is then ready to be strained into the spray tank, where it should be diluted to the proportions given above. The sulphur used may be in the form of "flowers," "flour" or "commercial ground," and should, if necessary, be run through a screen to break up lumps. Commercial substitutes for the self-boiled lime-sulphur may be used, but should not be confused with commercial lime-sulphur solution.

Spraying Apparatus

For the proper application of sprays some form of spray pump with suitable nozzles is absolutely essential. Most spray outfits are supplied with spray rods permitting the operator to direct the spray as desired. The hose should be of sufficient length to permit convenient spraying.

Spray outfits vary in size from small bucket pumps to gasoline power outfits for large-scale operations. Bucket pumps answer well for small home orchards where but a few trees are to be sprayed. Where the orchard interest is larger, and especially where older trees are to be treated, a barrel pump is essential. A barrel pump may be purchased for \$20 to \$25, depending on the equipment. In spraying, the outfit can be mounted upon a sled or placed in a cart or wagon. An outfit for operations on a still larger scale consists of a 100 or 200-gallon tank mounted upon a truck, having a strong double-acting hand-pump mounted upon it. For large commercial operations, gasoline power outfits are largely used.

Information concerning dealers in spraying material and apparatus can be obtained from reliable horticultural journals.

Further information on orchard spraying may be obtained by writing to the U. S. Department of Agriculture or to your State Experiment Station.

Early to bed and early to rise

Gives you a grip that you can't analyze.

Late to bed and late to rise

Sends a man quick to his home in the skies.

Get humus into your soil; that is the first need of most lands. Humus will enable you to grow bigger crops. Therefore, get humus, and, as the old Hoosier says, "Git a plenty while you're a-gittin', says I."

The Raleigh

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Told in Florida Grower, leader of State's agricultural press. It gives dependable information, treating bad and good with equal candor. Citrus interests have especial attention—experts discuss in its columns all growing and marketing problems. Official paper Florida Citrus Exchange, growers' organization. Subscribe it interested in Florida or in citrus culture. \$1.50 a year, four months trial 50 cents. Sample copy free.

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CASH PAID FOR ALL KINDS OF BAGS
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EAT APPLES EVERY DAY,
KEEP THE DOCTOR AWAY



A Tractor for the Average Farm

In these days when so much is being expected from the American farmer, power on the farm is one of the most important questions to be considered in farm management. The "big" farmer is not the only one who finds a farm tractor profitable nowadays. There is enough work on a farm as small as 160 acres, generally speaking, to warrant the owner buying a general purpose tractor—one that can do the plowing, pull the stumps, grind and grade the roads, fill the silo, pump water, run the corn sheller, the thrasher, the fanning mill, the electric light generator and other such tasks that are more or less common on every farm.

Dependable Power

The day has passed when a tractor for the general farm was looked upon as an uncertain source of power. There is no longer need to doubt its efficiency. Tractors are now on the market, which, in the hands of competent operators, give lasting and satisfying service.

By competent operators we do not necessarily mean an engineer, for any one with a mechanical turn of mind and a little study can soon learn to operate a tractor successfully. And by operating a tractor we do not mean simply knowing how to start, guide and stop the machine when it is in running order, but being capable of making adjustments and minor repairs as well.

Dependable Power for All Purposes

When the tractor first came into use, it was used principally for plowing, but present-day tractor owners find this machine valuable for many other purposes. The tractor demonstrations held last fall in many parts of the country did a great deal to make tractors popular. There is no doubt of this. But these demonstrations showed only the plowing and preparation of the seed bed. While this is one of the most important uses to which a tractor is capable of doing, it is by no means the only one. A man who finds the most uses for a tractor will find it the best investment. The tractor has the power; the question is finding ways to put it to profitable use.

Such standardization has taken place, mechanism simplified, unnecessary weight eliminated, until now the light farm tractor is a prac-

tical, all-purpose power plant furnishing a safe, simple, cheap motor power that very greatly reduces producing costs.

The tractor will do all of the plowing, in fact all of the farm work except some cultivating and certain odd jobs where the horse is manifestly more flexible and better adapted. During the rush period, the tractor will prepare the ground, with very little physical labor, several times as rapidly as with the horses. The same is true with the harvesting, which can be done at the right time. It also solves the labor problems. But the field and road work is only part of the work a modern tractor performs. Used as a stationary engine it can be attached to any machine that is operated by belt connections.

The Tractor as an Investment

Some farmers who already have their farm well stocked with horses hesitate to dispose of them and invest in a tractor. They say they have as large an investment per acre—for power—as conditions justify. But why figure the investment in a tractor on the basis of the investment in horses or any other power? A farmer does not figure any other investment he makes on this kind of a basis.

If a man is thinking of buying another farm he does not figure that just because he owns a farm worth so many dollars an acre he can not afford to buy another farm worth more dollars an acre, if the second farm is more fertile and better located and will produce a greater percentage of profit on the investment. Men are not stopping at paying a dollar a pound for certain kinds of seed to take the place of other kinds of seed costing only a dollar a bushel, because they believe that the dollar a pound seed will, in the end, bring them much greater returns, even though the investment is much larger.

So why should a man figure that the amount which he has invested in animal power should determine the amount which he can afford to invest in any other form of power? This is the only true basis on which to figure the purchase of a tractor. A man should not figure the investment in a tractor against animal power on the basis of dollars against dollars—but results against results.

Now, let us consider tractor and animal power on the basis of the re-

sults which one can get from his investment. In the first place, even if we consider a tractor as replacing only one-half as many horses as its rated traction horse-power, carefully compiled statistics show that the yearly cost of the tractor will be from one-third to two-thirds less than horses. This in itself would show that, if necessary, a man could afford a much larger investment in a tractor than in the horses which it replaced, because of the fact that the yearly cost of the tractor will be much less.

In the second place, a much larger investment would be justified in a tractor, if it were necessary, for the reason that with a tractor much larger crops can be raised. President J. H. Worst, of the North Dakota Agricultural College, states that by adding one additional dollar's worth of labor to each acre there is little question but that the average profit would be doubled. The Kansas State Agricultural College proved in four years' tests that by plowing deeper and plowing at the right time the size of the crop could be increased as much again as when following ordinary methods. The North Dakota Agricultural College has likewise made experiments with similar results.

Now, the significance of this point is in the fact that the tractor is the only kind of power by which the additional work required to raise these larger crops can be efficiently done. The tractor is the only kind of power

which is sufficiently concentrated, which has the necessary endurance, and which can supply the amount of power required for doing the heavy farm work in the right way at exactly the right time.

Choosing a Tractor

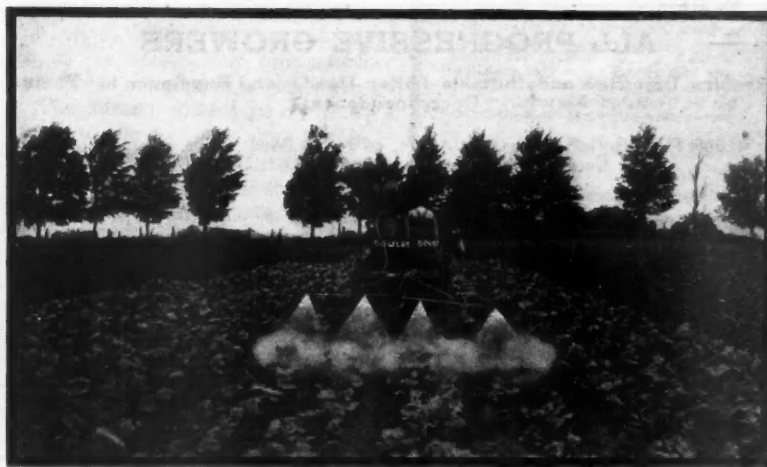
When you have decided that you can use a tractor to advantage on your farm, the next thing to consider is the make. First of all, plan to deal with firms of known reliability. Many a farmer has come to grief because of not heeding advice along this line.

Then, the price to be paid should be sufficient to insure a serviceable machine.

As to size, it is easier to make a mistake in getting too small a tractor than too large a machine. The cause of such a mistake results largely from looking first at the question of the cost of a tractor rather than the question of the results to be secured from its use. The size tractor that every farmer needs is not the tractor that will enable him to do his work in the way he is now doing it, which is in the majority of cases not the way in which farming should be done to raise the biggest crops, but the size tractor which will enable him to do all his work in the right way and at exactly the right time in order to raise the largest crops possible.

Definite experiments have been made which show that to increase the depth of plowing from one-half to double the usual depth, will greatly increase the crops. Deeper plowing results in a better root bed for the plant. It increases the food and water supply. Probably the most accurate tests of the importance of deep plowing have been made by the Kansas State Agriculture College. By increasing the depth of plowing from 3 inches which they say is "common practice among farmers" to 7 inches it was found that the increased depth gave an increased yield of 6½ bushels per acre in a three-year average.

Experiments made by the University of Wisconsin show that to double the depth of plowing, requires an increase of 70 per cent in power. Plowing in the early summer when the ground is hard likewise demands more power.



Spraying Cabbage Plants with a Barrel Sprayer and Field Crop Attachment.

Here's an outfit that can be used with an ordinary farm truck, and will give excellent service. It consists of a hand-operated barrel sprayer, such as every fruit grower has on the place, and a four-row field-spraying attachment which can be clamped to the rear end of the truck. Two men can spray any sort of truck crop as fast as the team will walk.



"This is for you, girls!"

It's the most wonderful separator I ever saw. I just brought it from Johnson's Hardware Store where they were demonstrating it. You can't guess what it will do."

"I think I know, father. You told me last week about the loss of cream in our old separator when I turned it too slow. You timed me and pretty near scolded me when you found I was turning 37 revolutions instead of 50. This is the separator that "skims clean at any speed". It's a

SHARPLES

SUCTION-FEED CREAM SEPARATOR

"Mary is a smart girl, mother—she guessed it. We all helped to test it and it skimmed to a trace when turned as slow as 36 and equally clean when turned as fast as 55 turns. It simply skimmed faster when we turned it faster. And the cream remained at 35% thruout the varying speeds."

"Why, father—then we will know exactly what the cream check will be each week, wont we?"

"Indeed we will, mother. Now look at the bowl. It's a plain straight tube with a small ring like a napkin ring in it."

"Goody!—I'll get thru washing up in a jiffy, no discs!"

"Yes, girls, and note the knee-low supply tank, and the automatic once-a-month oiling—it has any other separator I ever tried, beat a mile. But then—it's made by the oldest and largest Separator Works in America."

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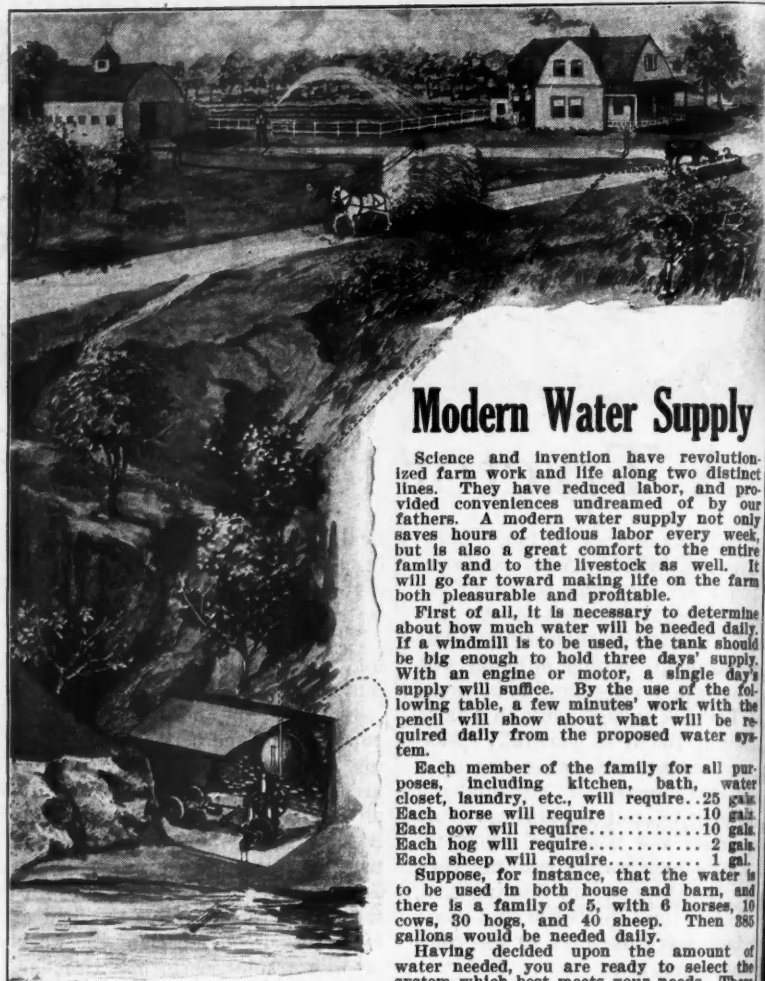
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Modern Water Supply

Science and invention have revolutionized farm work and life along two distinct lines. They have reduced labor, and provided conveniences undreamed of by our fathers. A modern water supply not only saves hours of tedious labor every week, but is also a great comfort to the entire family and to the livestock as well. It will go far toward making life on the farm both pleasurable and profitable.

First of all, it is necessary to determine about how much water will be needed daily. If a windmill is to be used, the tank should be big enough to hold three days' supply. With an engine or motor, a single day's supply will suffice. By the use of the following table, a few minutes' work with the pencil will show about what will be required daily from the proposed water system.

Each member of the family for all purposes, including kitchen, bath, water closet, laundry, etc., will require .25 gal.
Each horse will require .10 gal.
Each cow will require .10 gal.
Each hog will require .2 gal.
Each sheep will require .1 gal.

Suppose, for instance, that the water is to be used in both house and barn, and there is a family of 5, with 6 horses, 10 cows, 30 hogs, and 40 sheep. Then 385 gallons would be needed daily.

Having decided upon the amount of water needed, you are ready to select the system which best meets your needs. There are two distinct systems available, the gravity or tank system and the pneumatic or air pressure system. Either of these may be operated by windmill, gasoline engine, or electric motor. Where there is a stream with 3 feet or more of fall, a hydraulic ram may be installed and will deliver an abundance of water for many years at practically no cost.

Power pumps are now becoming exceedingly popular, and may be had with electric motor built in. This is, of course, the ideal power where current is available.

The pneumatic tank does away with nearly all the objections of the elevated tank, and is simple and practical. The water is pumped into an air-tight tank, usually located below the ground.

Thus, the water is fully protected against freezing, and is kept cool and refreshing in summer. The pressure of the condensed air raises the water in the pipes, driving it wherever required. An air pressure gauge shows the pressure at all times.

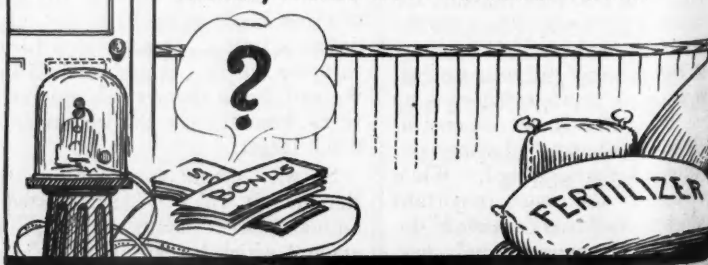
There are several other factors that should be considered in planning a water system—the size and arrangement of the piping and the right type and size of pump. The large manufacturers of pumps now have well-equipped service departments which will set you right on these details.

Your family deserves all the comforts you can provide, and an abundance of pure fresh water is a prime essential to success with live stock. Why not insure both by installing a modern water supply this season? An added advantage is the protection afforded against fire by a water pressure system.

INVESTMENTS for FARMERS

"The investments of the farmer which pay the largest interest are the investments in fertilizers in good live stock, in good machinery and other forms of equipment."

Dean F.B. Mumford,
University of Missouri *or* The Banker-Farmer.



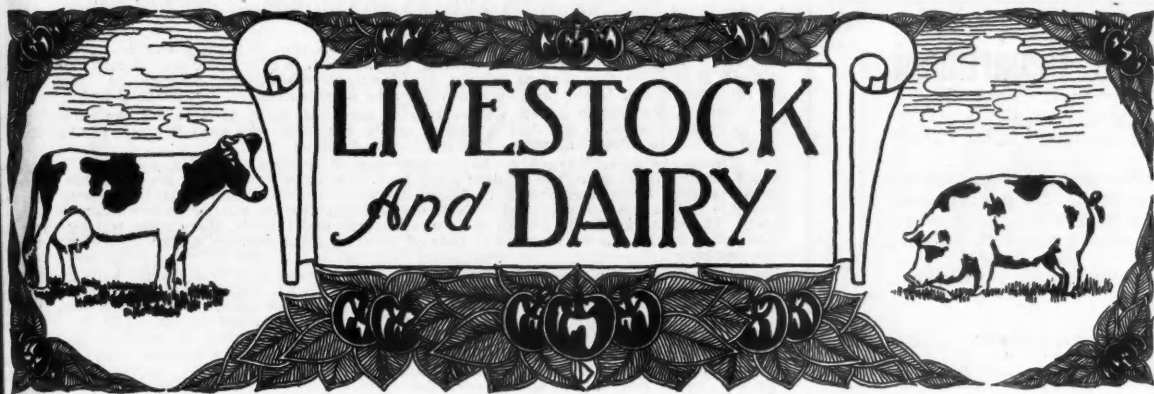
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Minute Men of '17

Farmers of '76 left their plows and went to Concord to fight for American independence. These embattled farmers, says Emerson, fired shots that were heard 'round the world. Farmers of '17, moved by the same kind of patriotism, will stay behind their plows more days and longer hours and produce food products that will go 'round the world. The creeping food crisis must be checked by the collective effort of North American farmers. What is done must be done shortly for the season is advancing. There is time, however, for planting many important crops.

May and June are the proper months for sowing cowpeas, soybeans, millet, sorghum. Early maturing corn may be planted in southern sections up to the last of June. These sections should extend their plantations of corn. As the estimated wheat requirements of Europe are 360,000,000 bushels more than the available crop estimate promises, the shortage of wheat will probably compel the general use of whole wheat flour, and this will mean a shortage of grain by-products for stock feed. Hence, every pound of legume, hay, millet or sorghum above the usual production is a safer insurance against a food shortage for stock. Keepers of livestock who act promptly and wisely will be able to hold for the satisfactory markets. Others will have to sell the feed is used up.

An extra acre or two of peas and beans for hog grazing during the first part of fattening will save millions of bushels of corn for other uses, and at the same time the family smokehouse will contain meats of better quality.

An extra acre of late potatoes for market, or an extra patch for home use, as not have to buy in late winter from a diminishing general supply will help the city poor to supply themselves with a wholesome article of food at reasonable cost.

Roots Crops for Stock

During the past score of years American agricultural history, discloses many notable efforts to work more economical feeds for stock. Alfalfa, the vast increase in the production of alfalfa, clover and other nutritious crops, and the better understanding of the balancing of rations have exerted an important influence on the live-stock industry.

These gains in the production of feeds adapted to the uses of stock have not been made without loss. On account of enthusiasm for the newer kinds of feed, the cultivation and use of root crops have gradually declined. There are signs now of a revival of interest in root crops and the pending feed shortage is likely to restore to favor general farming crops that should never have been given up.

The practical experience of many breeders supports the belief that roots have more than the generally accepted value in the ration. Successful horse breeders place much dependence upon the carrot crop. Many sheepmen would not think of entering the winter with their flocks without a good supply of roots. One of the most successful farm managers, who has broken one world's record after another with a popular dairy breed, who succeeds where many fail, attributes his success, in a large measure, to the liberal and continued use of mangel-wurzels in the dairy ration from fall frosts to spring grass.

The planting season is upon us. Every place should grow enough roots for the family cow and family horse. Where stock is the chief industry of the place, many acres of roots should be sown. Mangel-wurzels produce as much as sixteen tons per acre.

Apple Pomace Silage

Apple growers who keep stock as a side line will be interested in experiments which prove a common waste product to be of feeding value for the stock. The Vermont Experiment Station has found that cows prefer apple pomace silage to hay or corn fodder, and that it has a value, pound for pound, quite similar to that of corn silage. The daily allowance of pomace silage was from 24 to 35 pounds, about as much as a cow would eat, in addition to a supply of 8 pounds of grain and 10 to 12 pounds of hay per day. When fed apple pomace, the cows are reported to have consumed somewhat more dry feed than the cows which were fed corn silage, but it is also reported that they made a corresponding increase in milk flow. No bad results from feeding the apple pomace as silage are mentioned by this station.

What Makes a Good Cow

This question does not search for moral values in a cow; it refers to the production of milk and butter. How

much of these must a cow give to be entitled to be called a good cow?

A Cow Testing Association in Minnesota answers the above question by telling what 46 cows of the 300 in the association did during the month of January.

Forty-six cows made better than 8,904 gallons of milk, an average of 193 gallons per cow per month. This quantity of milk yielded 2,445 pounds of fat, an average of 53 pounds per cow for the month of January. This fat was worth \$1,148.22. In other words, each cow produced an average of \$24.98 worth of butter fat. Yes, but it cost a lot of money to feed these cows. Did it?

The total cost of feed for the 46 cows was \$478.01, \$10.58 per cow. But the butter fat from these 46 cows brought \$1,148.22. For every \$1.00 worth of feed, they produced \$2.35 in butter fat, and the pigs and chickens got the skimmed milk. The best cow in this test produced 77 pounds of butter fat, valued at \$36.35.

The Velvet Bean

The combination of corn and velvet beans is exciting considerable interest in many sections of the southern tier of states. Planted at the same time the beans find the corn stalks ladders over which they are said to run riot until they have obliterated the corn.

Farmers who have tried out this combination have found that cattle and hogs have only to be turned into the field and turned out in the spring with no other feed.

The velvet bean will grow as far north as Tennessee, but how much further north remains to be determined. The variety known as Medium early proves best in the more northerly parts of the bean-maturing zone. Planting methods vary. Some farmers plant two rows of corn and one row of beans, some plant wide rows of corn with beans between, and some use beans for every other row. In all cases, the vines are said to submerge the corn. Southern farmers should consider extra planting this season as a war measure.

Early Pigs Profitable

The North Dakota Experiment Station says pigs farrowed in March make the big profit, because pigs farrowed early make the best use of green pastures through the summer months, and are just ready to be turned into

the corn field when it is ready, and can be marketed off the corn by the middle of November. This also applies to the production of meat for home use. Again the times call for that extra acre. Every fruit grower and farmer who produces only enough meat to supply the home is helping that much to solve the food question during the term of the war and the period of reconstruction following the war. It will be several years before the world can get back to normal conditions.

REBUILDING ON BIG SCALE

Detailed plans are now completed and in the course of execution for rebuilding the burned portion of the plant of The Hydraulic Press Mfg. Co., makers of the well-known cider and vinegar presses, on its present site in Mount Gilead, Ohio. The plans also include the erection of two additional buildings which will give more adequate manufacturing facilities for their rapidly expanding business. In all, the plans cover the erection of four complete new buildings consisting of a machine shop, a three-story stock-room, a new power plant and a structural and forge shop. The machine shop and stock-room are replacements on a much larger scale of the portion of the plant recently destroyed by fire. The new buildings will be completed and in operation by July 1st.

Hard work is a blessing. Overwork is an evil. More brain and less brawn will sweeten life and make the pocket-book fatter.



Grow Them Like This

with long, deep, meaty hams and well-sprung ribs. He stands shipping well and tops the market when he arrives. He makes the choicest bacon and dresses out with the least waste. For quality and profit, breed

Berkshires

They farrow large litters of lively, active pigs that are seldom crushed by the mother. These youngsters soon rustle for themselves, making rapid gains on inexpensive feeds. Berkshires mature early and fatten easily at any age. Hardy and vigorous, they thrive in all climates. Send for our free book "Berkshire Hogs" and learn facts about this money making breed.

American Berkshire Ass'n

52 E. Monroe St. Springfield, Ill.

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Home, Factory and Institution

Aten Sewage Disposal System

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AS THE SEED BED, SO SHALL THE HARVEST BE

Not for many years has it been so true as now that a hungry world is looking to the American farmer for breadstuffs—willing to pay well for it, too, as current grain prices plainly show. So the prudent farmer is planning to make every acre of the old farm yield to the limit. And to do this, he knows that he must provide a perfect seed bed.

Oats thrive best in a firm well-compacted seed bed, so it pays to get the ground plowed as early as possible. Soil that is turned up by the plow will soon dry out if neglected. Good plan is to follow the plow closely with the harrow.

There are several types or harrows in use in different sections, but none has proved more satisfactory than the coulter type. In this kind of harrow long flexible blades or coulters take the place of teeth. These coulters are so arranged as to present the least possible resistance to the ground. Each turns a tiny furrow, slicing clods and pulverizing the soil. The sharp knife-like blades cut through trash and stubble, thoroughly mixing them with the soil. Spurs, one between each pair of coulters, still further aid in completely crushing the lumps.

Any one who has tramped weary miles behind a team over soft ground with grit filtering into his shoes will appreciate the comfortable seat with which these coulter harrows are fitted. The teamster can ride without any strain upon the team. In fact, his weight makes the harrow "bite in" as it should. Because the blades are so shaped as to cleave the way through the soil, the team finds the draft unusually light for the work accomplished.

The farmer who plows his oat ground early, working it down at once with a coulter harrow, has taken the first step toward a perfect seed bed. The surface has been leveled, broken, and a dust mulch spread over the surface that prevents the escape of soil moisture. Usually three harrowings are required to complete the job. Where this plan is followed it is surprising how easily the oat ground is brought into a perfect state of tillage.



The soil will be found compact and firm in the lower portion of the plowed depth—fine and mellow as fresh ashes at the surface—the ideal seed bed for oats.

Every oat kernel contains within itself a tiny plant beside sufficient food to sustain it until well rooted. But, for the proper germination of the seed, there must be an abundance of moisture and soil air, also sufficient warmth to start growth.

When the oat kernel is planted in a well-prepared soil, such as that described, it has a suitable home for growth and development. There is plenty of moisture because the soil has been thoroughly compacted below, establishing moisture connection with the subsoil that the soil water creeps upward in a thin film from soil grain to soil grain. The dust mulch at the surface prevents the soil water from escaping through evaporation and allows the air to penetrate freely.

Soon the kernel bursts, a slender leaf-blade shoots upward seeking the light, and white rootlets feel their way out among the soil grains in search of food. Lucky for them there are no hard clods or empty spaces where the tender rootlets would dry and wither away. The oat plant which has been provided with a fine, mellow, well-compacted seed will soon reward the far-seeing farmer. It will grow rapidly and steadily, forming a crown and a vigorous root system well fitted to withstand drought.

The farmer who sows well-bred seed in a carefully prepared seed bed well supplied with plant food is the one who reaps those bumper crops that lift mortgages and buy automobiles.—Advertisement.

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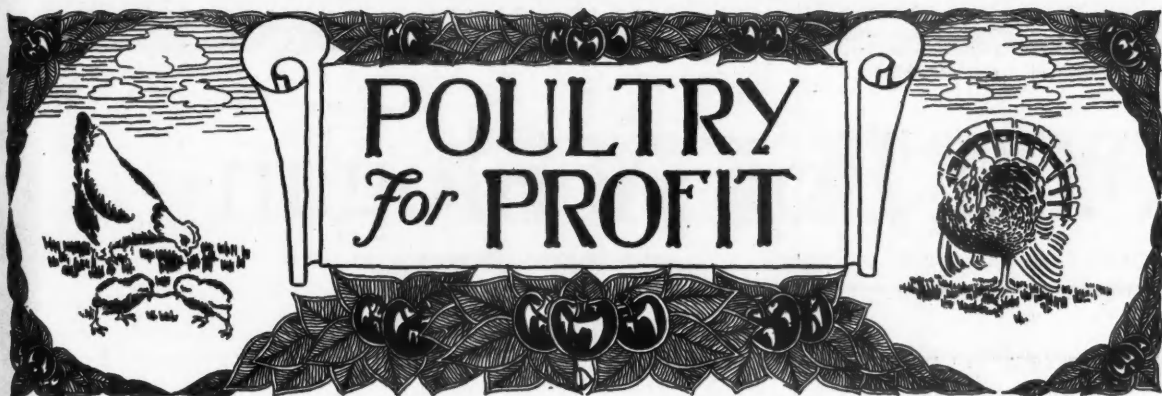
A farm that anybody may be proud to own. 440 acres, seven miles from Charlottesville, in good neighborhood. About half in grass (alfalfa, clover, orchard grass) and under cultivation, balance in wood and timber. Land, gently rolling and well watered by springs and swift-flowing branches.

Orchard of about 100 apple trees in excellent condition, and plenty of peaches, plums, quinces, and grapes for home use.

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Poultry Facts Worth Reading

C. A. LANGSTON, Editor of Poultry for Profit Department

Hatching for pullets for winter laying is over. Rearing will be the main interest from now on. It will be good practice to bring off an occasional hatch through the summer and fall to supply friers for the home table, but no one should think of saving the pullets and carrying them over winter. They will never pay for their keep.

Have the hatchings been satisfactory? If so, beware of carelessness. There is still a fine chance for failure. If the May hatchings have to be drawn on to make up the required number of pullets for winter laying, it will be well to remember that such stock is handicapped by lateness and that extra care will be needed to enable them to overcome that handicap.

Free Range Not Enough

No matter how ample and rich the range may be, all pullets for winter laying, the late hatched in particular, will need extra feeding. They should have at least two feedings of grain daily and they should have access to dry mash that carries some meat or fish scrap. The unprecedented high price of all grain feeds and grain by-products is forcing all of us to do some close figuring. We simply must practice every possible economy in order to make poultry keeping profitable, but as the requirements of growing pullets do not take world wars into consideration we should prod ourselves frequently lest we practice economy to the detriment of the growing stock and so defeat in the end the very object of all our poultry work-profit. Pullets for winter laying must be mature in body and organs by cold weather, and any economy or neglect that postpones maturity will make the keeping of such stock unprofitable.

High Prices Next Winter

The prevailing opinion is that eggs will command high prices next fall and winter. Some are predicting a price of one dollar per dozen next Christmas, and this may come to pass. Whatever may turn out to be the upper limit, the average price will be considerably higher than the average of last season.

The high prices for eggs in PROSPERITY is the justification for extra care and the feeding of extra high-grade feeds. If the product commands the right price, the producer should not worry over an apparent

and imaginary high cost of production. If eggs brought ten dollars a dozen, poultry keepers could afford to pay one-half a cent a GRAIN for corn.

Keep No Drones

Poultry keepers should learn wisdom of the bees—they do not winter drones. The precious honey and pollen must be reserved for the spring workers. The egg-laying contests have proved that the best flocks have unprofitable individuals, what dairymen would call boarders. City and village poultry keepers have noted this fact. Having to buy all feeds, they are compelled to make their layers pay their way, and if any individuals do not pay for their keep such unprofitable fowls are prepared for the home table or for market. Fruit growers and farmers have been very slow to learn the lessons illustrated by these laying contests. The fowls received such feeds as were produced on the place, and the women used and sold such eggs as those fowls chose to lay. These two operations defined farm poultry keeping. But farm people generally are beginning to keep watch over all the feeding operations on the place. They had learned to figure the value of feeds in the terms of horse-power, of butter and milk, of bacon. At last they have come to figure the value of the feed given to the poultry on the place. Maybe the value of grains fed to the chickens is estimated, but the point is, fruit growers and farmers are coming to understand why closer attention should be given to the production of all individual animals and fowls kept on the place. The loafers, the boarders, the drones, must go. The high cost of feeds is their doom.

A Money-Making Pullet

The Kentucky Experiment Station reports that one pullet in the egg-laying contest held at that station has laid 95 eggs in 95 consecutive days. This is believed to be the world record; certainly the official record. Of course this is a remarkable pullet—one in a million. But you may have just such a pullet in your own flock. Have you any way of finding out? Perhaps not. But there is a way—the use of the trap nest, a nest with some kind of trigger or trap that confines the fowl until removed by an attendant. The leg band being numbered, the attendant can make the proper record on the

card prepared for the purpose. In this way non-producers are detected and removed from the laying house. In addition to the prompt reduction of unprofitable expense, the trap nest becomes the basis of intelligent breeding. It finds the profitable laying pullets, and the profitable laying pullets become the profitable breeding hens the following year.

It is only fair to say that the use of the trap nests involves frequent visits to the hen houses, and hence there is some question as to their general use on the farm. The ideal, however, is there, and the way to it is now open. Every poultry keeper must figure out his own problems. One thing is certain, the poultry keeper who studies the report of any one of the national egg-laying contests will never be the same. He may not introduce trap nests, but he will manage in some way to improve his flock and increase the profits. And this is one of the results of finding out that there is a better way of doing things.

Don't be stingy with the school-teacher. Get the best and pay for it.

He that giveth his neighbor a hunch is greater than he that driveth a 1917 model.

Nuts and bolts rattle off of new machinery like ripe grain out of the sheaf. Put nuts on with a little paint or red lead. Take a cold chisel and fix all nuts for keeps if they are not to be taken off for adjustment of parts.

CODLING MOTH TRAP

A codling moth trap has been devised by E. H. Siegler, of the Bureau of Entomology, United States Department of Agriculture, to be used as a substitute for what is known as the "banding" method for destroying the codling moth. The banding method, in which a folded strip of burlap is wrapped around the tree trunk, demands a considerable amount of labor, and the new trap is designed to minimize this.

The trap affords an attractive place for the larvæ to spin their cocoons, and it prevents the escape of the moths after they emerge from these. The trap, which consists of a burlap band covered by a strip of wire screen, is made as follows:

Strips of burlap 6 inches wide are folded into three thicknesses. The loose bark from the lower branches and trunk of the tree is removed and a strip of this burlap folded once around the trunk. It is held in place by large tacks, which should be driven in in such a way that the edge projects about one-fourth of an inch beyond the burlap. The burlap is then covered by black-painted wire screen with 12 meshes to the inch. This is cut into strips 6 inches wide and the edges of each strip are folded twice, allowing one-fourth of an inch to each fold. The strip of screen should be long enough to allow for an overlap of 3 to 4 inches when placed around the trunk of the tree. The wire screen is placed over the burlap band and tacked to the tree in such a way that both the



upper and lower edges fit snugly against the bark. The projecting tacks used to fasten the burlap to the tree prevent the wire pressing against the cloth. To make sure that no moths may escape through openings along the edges of the trap or along the flap, a thin coating of pitch tar may be used. This material, when heated, may be applied readily with a brush.

The traps may be placed on the tree at any time during the winter or in the spring not later than one month after the petals have dropped. As long as no openings occur in them they will require no further attention. The codling moth larva, having completed its feeding in the fruit, seeks a place to spin its cocoon, and for this purpose generally crawls up or down a tree trunk. Meeting the trap, it enters through one of the openings in the mesh of the wire screen and spins its cocoon beneath the burlap band. When it emerges as a moth its larger size makes it unable to escape through the opening in the screen by which it entered the trap.

It must be clearly understood, however, that this trap is not a substitute for spraying, but merely an additional precaution. Nevertheless, some larvæ will invariably escape, and the offspring of these are largely responsible for the damage to the fruit crop. By the use of the codling moth trap, in addition to thorough spraying, the majority of the unpoisoned larvæ may be captured and injury by later broods will be materially reduced.

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¶We want a better slogan than our present one, "Practical Fruit Growing and Marketing," for the AMERICAN FRUIT GROWER.

¶By slogan we mean a descriptive phrase which we can run at all times under the name AMERICAN FRUIT GROWER as a sub-title.

¶To the person sending in the best slogan we will give \$100.00 in cash. If more than one person sends in the slogan that is selected, the \$100.00 will be equally divided.

¶You can send in as many slogans as you desire. Each one should be written on a separate "Slogan Blank" or sheet of paper, with the name and address of the sender on each suggestion.

¶All slogans must be received by midnight of September 30, 1917.

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American Fruit Grower

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Send 25 cents, and the names of three people interested in fruit growing, for a trial 12 months' subscription.

YOU CAN USE THIS BLANK

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